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CONSERVATION OF HAWAII'S NATURAL RESOURCES

BEFORE THE LEGISLATURE SESSION OF 1909

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CONSERVATION
OF
HAWAII'S NATURAL RESOURCES

BEFORE THE LEGISLATURE, 1909

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ADDRESSES

BY THE GOVERNOR AND HIS CONFEREES WHO
ATTENDED THE GOVERNORS' CONFERENCE
WITH THE PRESIDENT IN WASHINGTON, D. C.,
IN MAY, 1908; AND BY OTHERS.

HONOLULU
HAWAIIAN GAZETTE CO., LTD.
1909

House of Representatives,

March 1, 1909, 2:15 P. M.

Hon. R. W. Shingle (in the chair).

Ladies and Gentlemen: The House has invited Governor Frear together with several other gentlemen who attended the governors' conference in Washington held at the invitation of President Roosevelt in May last, at which was taken up the conservation of natural resources of the country; and the Senate is sitting in session with the House to hear these gentlemen in order that they may gain from their remarks certain knowledge which will guide them in the matters which may come before the present session of the legislature

I will introduce Governor Frear, who will open the meeting with a few general remarks covering the situation.

Governor Walter F. Frear. Mr. Chairman, Senators, Representatives, Ladies and Gentlemen: The administration of President Roosevelt has been marked by an extraordinary number of not only remarkable events and achievements but great movements for reform and advancement, which could be instituted only by a man of his courage and energy, breadth of view and farsightedness. It is difficult to say which of these events or movements future historians will select as the most notable, but a great many believe that it will be the movement for the conservation, the development and the better utilization of the natural resources of the country. The people are becoming awakened as never before to the gravity of the situation, to the fact that the national prosperity is dependent upon the proper conservation and use of the natural resources. They are coming to realize as the result of recent investigation that the forests of the country will be exhausted in a single generation if the present wastefulness is not checked; they are coming to realize that there is very little public land left for settlement; they are coming to realize that in only a few generations the iron and the coal mines will be exhausted. Now, this movement for the conservation and development of the natural resources, while it has been preparing in one way and another for many years, has grown with wonderful rapidity in the last few years. It had its origin in many causes, but it came about principally through the feeling that the transportation facilities of the country were wholly inadequate. Many organizations had been formed to promote the development of various water ways in the country for purposes of

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transportation, and about two years ago the President attended a meeting of one of these, and as a result of that meeting and many requests made to him, he appointed a commission known as the Inland Waterways Commission, consisting, I believe, of nine persons, distinguished in their several lines of work, to investigate the subject of the inland waterways with a view to affording the necessary transportation facilities, which the railroads could not furnish. The farmers had not only to pay high prices for getting their products to market, but they actually could not get them to market at all in many instances because there were not railroads enough. This commission began work, but before it got very far, it found that the problem was larger than that of mere transportation facilities. It found that although there were 50,000 miles of inland water ways in the United States which were navigable or could be made navigable, that the United States was far behind European nations in the development of such water ways. It found that the water resources of the country had to be developed and utilized in a way to meet other needs than those of mere transportation, such as those of irrigation, generation of power, and domestic and municipal use. They found that the public lands were becoming very scarce and that in order to provide homes for settlers, expensive irrigation works would have to be constructed for developing the dry or arid lands. They found that the forests were being wasted so fast that it would be necessary to do something in order not only to supply the nation timber but to regulate the water supply. In those streams which were desired for purposes of navigation, at times there would be great floods doing great damage; at other times there was very little water. If the forests were depleted, this condition would become even worse, while if they were preserved and extended, there would be an even flow of water for purposes of navigation. And they found too that on account of the destruction of the forests, the soil was being washed away into the sea, the most fertile portions of the soil, thus destroying the land for purposes of production, and at the same time fouling the streams for purposes of domestic use. They found that the iron and the coal mines were becoming exhausted and that there was need of increased navigation by water so that the railroads would not have to draw upon those mines so much for furnishing transportation by land; they found also that both the national government and the state governments had to do with most of these matters and that they must coöperate in order to accomplish the best results. Accordingly, they advised the President to call a general meeting at which all the States as well as the nation should be represented, to consider the whole subject in all its phases. Such a meeting was called known as the Conference of Governors, which was held at the White House last May.

The President opened the meeting with a stirring address. There were present the Governors of nearly all of the States and Territories; also the members of the President's cabinet and the Supreme Court of the United States, and the Senators and Representatives of Congress. Each Governor brought three conferees. There were invited also representatives of about seventy of the great professional, scientific and industrial organizations of the nation, and other distinguished citizens, such as Mr. Bryan and Mr. Carnegie. For three days there were addresses by the most eminent men in the country upon all the different phases of this subject. It was a most impressive conference. One of its best results was the removal in large measure of the feeling, which had previously existed on the part of many, of jealousy against the encroachment of the national government upon the functions of the state governments. It was found that the national government on the one side and the state governments on the other each had their own peculiar functions, but that in order to accomplish the necessary results they had to coöperate, and that there was no desire on the part of either to encroach upon the functions of the other, except in so far as the other desired.

One of the recommendations of this conference was that the President should appoint a permanent national conservation commission, and that each of the governors should also appoint a conservation commission for local purposes, and for the purpose of coöperating with the conservation commissions of the other States and with the National Conservation Commission. At this conference my conferees were Mr. W. O. Smith, Mr. Hosmer and Mr. Gartley. After the conference I appointed as the conservation commission for Hawaii these three gentlemen and, in addition, Doctor Jared G. Smith and Mr. W. F. Dillingham. The President appointed a national commission of a large number of men, which has been subdivided into committees on the subjects of lands, waters, forests and minerals, and this national commission in coöperation with the state and territorial commissions has been at work since then making an inventory of the natural resources of the entire country, and making recommendations as to what should be done to prevent the waste of these resources and to facilitate their development. They reported in December at a joint conference of this commission and the governors. The meeting was opened by addresses by President Roosevelt and by President-elect Taft.

Since then another step has been taken. The President called another meeting, which has been held during the last month, of representatives of the great countries of the whole North American continent, the United States, Canada and Mexico. I believe he is now considering the calling of a still greater conference, a world or international conference, to be held in the near future at which shall be represented all civilized nations.

Now, I have given an outline of this movement. It is a movement that is growing; it is a movement that is already holding the attention of the people of the United States as scarcely anything else is. The magazines and the papers are full of it. It is something that we here in Hawaii may take home to ourselves. The problems here are just as serious, although on a smaller scale, as they are on the great mainland.

We have no mineral resources here to speak of, and so do not have to concern ourselves about those to any great extent. Fortunately our natural resources are of a better kind, for when mines are exhausted, as they will be sooner or later, they are gone forever; but other resources, such as those of the soil, the forests and the waters may be so used as to be developed and actually improved. Those are the kind that we fortunately possess.

We have no inland water ways to develop. We need not trouble ourselves about those, which present so important and difficult a problem on the mainland. Here there is a group of islands. We have water ways already made for us. Our population is mostly along the shores and we can have water transportation by sea. We need harbors, however, but here again we need trouble ourselves but little, except to present our needs to Congress. Congress is developing our harbors for us at a rapid rate. The intention is to have at least one good harbor on each of the islands. Work is already well under way for Honolulu harbor and Hilo harbor. Congress is now appropriating for a harbor on the island of Maui and one on the island of Kauai, and it is planned in the near future to take action in regard to another harbor on the island of Hawaii, on the Kona side, and a harbor on the island of Molokai.

Our natural resources are chiefly those of the soil and of the forests and of the sea. The resources of the sea have so far received but little attention. We have a great variety of the finest quality of fish, but there are not enough of them. A bill is pending now in Congress for establishing a fish hatchery for Hawaii with a view to increasing the quantity of fish in the sea, to supply the wants of all. It may be that we shall need to do something in that respect ourselves. Congress in general believes in helping States and Territories that help themselves. It is now helping us in many ways. It is beginning to help us in the matter of forests which is one of our most important natural resuorces, not merely for the purpose of the timber, but mainly for the purpose of conserving the water, for purposes of irrigation and power and domestic use. We need to experiment with a view to obtaining new varieties of trees which will be good for timber and which will grow at our high elevations, particularly where now scarcely anything will grow. Mr. Hosmer probably will tell you more about this; but the Federal Government has just begun making contributions to the Territorial Government for this purpose.

Our main natural resource is the soil, the land. You know as well as I that we have very little public land and that very little of that is suitable for purposes of settlement. A great deal of it which is suitable can be opened for settlement only at great cost by the construction of roads. We shall have to construct roads ourselves and probably out of the proceeds of the sales of public lands which are opened for settlement. Provision is already on our statutes for that purpose and a bill is pending now in the legislature for increasing the means for constructing roads. But there are other ways in which we may obtain more land for the purposes of settlement. We have great stretches of arid land, the most valuable of all land provided we can get water on to it. We need to bring water on to this arid land and make it suitable for settlement purposes. There are perhaps 100,000 acres that can be brought under cultivation in this way. You know what the planters have done. One-half of all the sugar land in the Territory has been reclaimed at great expense by irrigation works, and you know that is the most productive land. You know how much more productive taro land is, which is irrigated, than kula land, which is not irrigated. Now, if we can get the United States to extend its reclamation service to these islands, we can probably bring under cultivation 100,000 acres of land which is now practically useless. This land will go a good deal further than land which is not irrigated, because it will produce so much more that each person will not need so large a tract. It will also be much easier and less expensive to open it, because it is now comparatively free from rocks and from forest and it will be comparatively inexpensive to construct the roads. But it may be that, in order to bring this about, we shall have to do something in the way of a hydrographic or water survey, which is preliminary to reclamation work. It is the practice for the Federal Government to help the different States and Territories in the matter of a hydrographic survey when they also contribute to that work. It is comparatively inexpensive and if we can contribute something for that work we will probably receive help in that line from the Federal Government, and besides we shall receive benefits in many ways which will come from that. It will show us what water we have, where it is, how it can be got at and how it can be utilized for the various purposes for which it is needed.

This is not all. We need not only more land but we need to know what to do with the land, what kind of crops to raise on it, how to cultivate it, how to make the best use of it. Many people seem to think that almost any one can farm. But this is a day of scientific farming. It requires the scientist to ascertain what kind of crops can be raised, to analyze the soil, to experiment with crops from different parts of the world to find out where the best seed can be obtained and how it can be obtained, to instruct the people how to cultivate. Any one going about these islands can see how much need there is of scientific investigation and instruction.

We have but to look at the planters' experiment station to get a lesson in this respect. There is an experiment station, perhaps the finest private experiment station in the world, maintained at an expense of $70,000 a year, but saving the planters or making for the planters probably several million dollars a year through their experiments and investigations which cover not only these subjects to which I have just referred, but the combatting of the insects and diseases and pests of one kind and another. We need something in that direction for the small producer. We want to enable him to profit by scientific investigation and instruction just as much as the sugar planters are profiting through their experiment station and through lines of scientific work. A large industry can do things for itself, but many small industries find it hard to combine and act together. The government often must act for or with them. A great deal has been done, a great deal is being done in this respect through the Hawaii Experiment Station,—of which probably Doctor Wilcox will speak,—through the Bureau of Agriculture and Forestry and in other directions. The Federal Government is helping. It contributed $30,000 last year and $35,000 this year and will contribute $5,000 additional each year until in a few years it will contribute $50,000 a year for the College of Agriculture and Mechanic Arts. It is contributing for the Hawaii Experiment Station,—at first $15,000 a year and gradually increasing it until it will soon be $30,000 a year. It is helping now, as I have said, also in forestry work. It is helping in other lines of work, but it expects us to do our part. Hawaii has generally taken an advanced position, as, for instance, in health matters and in school matters and it has grown in political ways. It is taking hold of these scientific matters in connection with agriculture, but more should be done. As little as possible should be spent for the actual machinery of government, so that we may have more to put into these other things which will add to the material prosperity of the country. There is a great deal that can be done yet and at comparatively little expense. Probably an additional $100,000 would result in the saving or the making of millions of dollars for the small producers in the very near future.

I have talked longer than I intended. I have talked in a general way. Those who follow me I hope will speak in more particular ways.

The Chairman (Mr. Shingle): Professor Ralph S. Hosmer, the Territorial Forester and also chairman of the Territorial Conservation Commission, will be the next speaker.

Mr. R. S. Hosmer. Mr. Chairman, Members of the Legislature of Hawaii, Ladies and Gentlemen: Governor Frear has said that the four main classes of natural resources are forests, lands, waters and minerals. The investigations of the National Conservation Commission during the past year have shown, as the Governor has also pointed out, that many of these resources are not inexhaustible as we have fancied in the past, but that the end of the resources of the United States is in sight unless steps are taken to adopt far sighted and comprehensive plans for their proper management and wise use. Therefore, conservation has become one of the paramount problems of the hour, one in which Hawaii has a peculiar interest. There are few places in the world where the principles of conservation can be seen to be at work so readily as here in these Islands. Let me recount briefly the reasons why this is so.

Hawaii is essentially a country dependent upon agriculture. Lying in the sub-tropics as this group does—mountainous islands in the trade wind belt—it follows that Hawaii has a climate characterized by extremes. In the windward districts is heavy rainfall; on the lee side of the mountains dryness, even approaching aridity. On each island it is the same: Hilo and Kau; Hana and Kula; Halelea and Waimea. But it does not follow that the rich land is necessarily in the moist districts. There is in the dry districts, even in the districts which approach aridity, much rich soil which with water can be made productive. Hence it follows that irrigation is a natural consequence in order to make some of the best lands in the dry districts productive. Without moisture these lands are of little value and so it follows that where water is not to be had naturally, it must be got artificially—which means irrigation.

The Governor has already pointed out how the large plantations at very considerable expense have brought out water from the windward side to irrigate their fields. Fortunately on the windward side of the Islands there are numerous streams, which, with the artesian water in other places, are sufficient to supply most of the needs for water if the forests and the streams are handled in a judicious manner. Because of the steep, short water sheds, it is essential that there be maintained a cover of vegetation on the catchment basins of the water sheds. Without such a cover of vegetation, the water quickly runs away, not only being lost to human use, but doing considerable damage through the erosion of the upper parts of the valleys and the flooding of valuable lands below. The Hawaiian forest is admirably adapted to act as a protective cover on the water sheds. When the water shed is covered with vegetation the dense tangle of trees, shrubs, vines, ferns and moss retards the runoff, prevents erosion and stores up the rainfall. The water is then gradually given out to feed the springs and streams, which results in a fairly constant flow. The native forest is the best possible cover for the water shed. Consequently, in view of the value of water to the Territory, the only wise course is to protect the forest cover on all the streams that are or may be needed for economic use. The preservation of the forest saves the waters. The assurance of a dependable supply makes possible the development of land that could not otherwise be turned to useful account. In Hawaii, lands, waters and forests are interdependent, so that a policy of conservation is essential.

The Hawaiian forest is easily damaged from fire, cattle and from other causes and it is essential in order to get the best results that the forests be protected. That the forests may be better protected and more easily handled to the end that the waters they safeguard may be used in economic ways, forest reserves have been created and will continue to be set apart.

There have now been established sixteen forest reserves on the four main islands of the group with a total area of 444,116 acres. Of this 61% is government land. It is probable that the creation of forest reserves will go on until eventually about three-quarters of a million acres will be so included, and these forests should be maintained and kept intact so that the water from their streams may be turned constantly to human account.

At this point I may say that the relation of the forests to the streams is essentially the feature of Hawaiian forestry and that wherever there are streams, the forests should be protected. In some of the leeward districts, there are forests which may be treated from a commercial standpoint, because in those localities there are no running streams and only a few springs to be conserved. But far and away the most important use of the Hawaiian forest is that it protects the streams. Wherever there is a water which may be turned to account this is the chief value of the forest.

The Governor has also pointed out that there are other uses to which forests may be put. The waste land, especially at the high elevations on the greater mountains of the Territory can be made to grow trees which are not native to Hawaii, yielding valuable commercial timber, such as the timber which we have to import from the coast. The Federal Government, through the Forest Service, has this year given the sum of $2,000.00 for experimental work in planting pines, spruces and firs at high elevations on Mauna Kea and Haleakala. Inclosures are now being made in which experimental lots of these trees will be set out. This is a step that should lead in time to the afforestration of those mountains.

The relation of forests, waters and lands is of peculiar importance and interest in Hawaii. These three natural resources are interdependent. The essential need at the present time is for the careful study and investigation of the local water problems by trained men—the experts of the United States Geological Survey at Washington—as a preliminary step to the extension to Hawaii of the Reclamation Service. The Federal Government is willing to coöperate with the States and especially with Hawaii, provided the initial move is made from this end through the appropriation of a comparatively small sum. The Federal Government will go more than half way, but the initial move must be made here. It is for this reason that it is so important that some action be taken by this legislature to get this work started, for there is no way in which the Territory can be so developed as through the intelligent application of the principles of conservation.

The Chairman. The next speaker will be Doctor Jared G. Smith, who will talk on conservation as related to Kona forests, waters and lands.

Dr. Jared G. Smith. Mr. Chairman and Members of the Legislature, Ladies and Gentlemen:

The conservation of natural resources means the saving of money, the saving of property, that we, the people of Hawaii, own, for the benefit of our children and our children's children. The resources in the way of forests, of timber already existing on public lands and on lands in private ownership amounts to an enormous figure, provided you can translate standing timber into terms of merchantable timber.

As you know, I am living in Kona, and have been taking note of what we have in Kona, both in the way of standing forests and of water. A stretch of virgin forests, untouched by the hand of man, extends from Kahuku, or from near Kahuku, to the slopes of Hualalai, a forest some fifty miles long and at its widest point considerably over five miles in breadth. The standing timber on this land, magnificent trees of large diameter, containing a good many hundred feet, or in some cases nearly a thousand feet of merchantable timber, approximately estimated, amounts to about 150,000,000 feet, board measure. So you can see that the Territory and the people actually own a great deal of property which unless they take very good care of it may be destroyed. I have seen, and you have all seen, much forest land destroyed by fire. There must be protection of this money, of this property, that belongs to the people of the islands—it not only belongs to us but belongs to those who come after us. There must be action taken to protect it from destruction. Much of this forest is on land privately owned, but a very considerable amount of forest of high money value as property exists on government lands and belongs or should belong to the people of the Territory and should in course of years to come provide a great deal of revenue for the support of the government.

Besides preserving the forest because of its actual money value as property, there are other good reasons why we should preserve our forests. The chief one of these is that of conserving the moisture, preventing the too rapid run-off of water. I have made a hurried calculation of the rainfall of that forest belt, which I know or which I know in part, that in the Kona district on the Island of Hawaii. Taking a rainfall—an estimated rainfall—not an unreasonable one—say 100 inches a year (there have been private records taken some time back, some 10 or 12 years ago, showing that the average rainfall at about the lower edge of the forest is considerably more than that)—but taking the rainfall of that Kona forest as being 100 inches a year, we will say that there are 200 or perhaps 250 square miles of forest, and 100 inches of rain per acre amounts to something over 2,000,000 gallons of water. The rainfall, the actual amount of water that falls on a square mile of land at the rate of 100 inches a year amounts to 16,000,000 gallons of water for every inch, I believe. The actual amount of water that falls in that Kona forest—and that forest is on the dry side of the island—amounts in the course of a year to 400,000 billion gallons of water, an amount that is absolutely beyond comprehension. And yet no effort has been made to conserve that water. We have just had a drought affecting the whole dry side of the Island of Hawaii. We had to buy water, but during years past and for all time there has been this enormous quantity of water that could have been, much of it, conserved for the benefit of agriculture, not only in the Kona district but elsewhere on the island. Not 1 per cent., I think not one-tenth of 1 per cent., of the water supplied by the rainfall is now preserved for use by the plantations or by the farmers. It is a money proposition; it is a business proposition.

In New England they have found that it pays to buy land and plant it in forest, plant it in varieties of trees which will not yield merchantable timber for fifty years to come, and yet such plantings, some of them, have already yielded an income of 2½ per cent. per annum for the entire term. The government can do that kind of work and should do it. Much of this property belongs to the government, belongs to the people. It is proper, it is right, it is good business; in fact, it would not be good business not to do it, to begin to take care of some of the property belonging to the people. There is water and abundance of it to spare. There is timber to last for many years, that which is not standing, merchantable timber. Just one day last week I was up in the forest. I saw great koa trees six feet in diameter, thirty and forty feet high, nothing being done to protect them, because there was no money to pay for the protection of this valuable property.

Without the forest to retard the run-off, there follows flood and destruction. We have all of us seen the ocean reddened for miles from the land with the surface soils from our cultivated fields. We have seen fields, the entire surface, swept into the ocean. This loss is not simply a loss to the individual plantation or the individual farmer affected, but it is a loss to the Territory—it is taking away from the natural resources of the Territory some of its capital. Besides the actual conservation of water, in order that we may use it, besides the actual preservation of forest in order that we may use it, and besides, well, besides both these, we must conserve both the forest and the water in order to save our soils. Water is necessary for the growth of plants, it is necessary for our domestic stock. If any one of us discovers that he has a hole in his money pocket, he mends it; it seems to me that the Territory has a hole in its money pocket, and the Legislature should see that there is a hole there and try and stop it, in order that loss of actual property resources shall no longer continue.

Senator Fairchild. May I ask a question in regard to one matter? That is in regard to the Kona district. There has been a bill introduced in the Senate by Senator Baker, I believe. I want to ask if that is the same district which this bill will cover.

Senator Smith. Yes, it does; Kona and Puna—the same district.

The Chairman. I think it does. The Forest Committee of the House was very much pleased when Judge Dole consented to address you. I am going to call on the Judge now. He will address you on forests as affecting rainfall.

Judge Sanford B. Dole. Mr. Chairman, Ladies and Gentlemen:

Mr. Hosmer has, I think, sufficiently dealt with the subject of forests as affecting conservation of water for irrigation purposes and for purposes of power. Mr. Jared G. Smith has carried on the discussion of that proposition a little further and brought up the matter of conservation for the collection of water in districts where there are no streams for the purposes of irrigation and domestic use. Hawaii is a large island with a pretty dry interior, and between this large interior and the outside slopes of the island are large and extensive forests. Hawaii has never been explored thoroughly, but it is being explored at the present time in regard to its forest assets from a commercial standpoint. Those of us who have grown up in these islands and have seen the clouds pass wooded ridges and over the dry slopes beyond have noticed how the clouds disappear, lessen, and finally are gone, and how in some parts of the islands, as in Haiku on Maui, rains will exist all day over the forest in that region, the trade-winds carrying the clouds along past the forest, over the dryer lands where the different plantations are cultivating cane by irrigation, and how these showers gradually disappear as the forest areas are left behind—we cannot help believing that forests have an effect on rainfall, in these islands at least. The operation is observable to the eye, and the effect of forests in that relation is not limited to the actual area of the forests. It is, I believe, ascertained that the air from forests is cooler than the air from lands devoid of vegetation, and this is one reason why clouds appear above forests and not over surrounding regions that are devoid of vegetation and where the air above them is saturated, is full of moisture; the cooling air is more likely to produce showers than the air from other regions which are bare of vegetation. It may be said perhaps more correctly, not that forests create showers or produce them, but rather that they allow the showers to come down. They remove the obstacles. The islands, as has been said, have all the problems of conservation except those that relate to mines. And it is probable that we have suffered almost as much as the United States in the loss of forests, for since the time that cattle were introduced in these islands by Vancouver and have increased, forest destruction has gone on mainly through their ravages, which has destroyed the undergrowth, thus causing the forest to recede. It is in the memory of not very old people how the forests between here and Waialua came nearly down to the road, how the large forests on Mauna Haleakala came nearly down to the mission, and that all over the islands recession of forests has been very noticeable. And the forests that are left are the merely commercial assets or are something to be preserved permanently for the protection of the agricultural and domestic interests of these islands. I was just talking with Mr. Herbert as I came in. Mr. Herbert is very strong against destroying forests for any purpose. He believes that it is a mistake. I am under the impression that forests to be taken care of according to the most modern scientific methods must be taken care of with a view of receiving some revenue from them. The government gets tired of giving out money perpetually to protect a forest. If the forest can only pay its own expenses, or yield some revenue, the probability of its being taken care of is much better. The proposition is up to the government now in regard to the forests of Kona and Kau. Enterprising companies are asking the government to allow them to cut down some of these big old forests that were hardly known to exist a few years ago, and the government don't know exactly what to do. If forests have no affect on the rainfall, they might just as well cut those forests down and sell the lumber and make what they can out of them; but if the forests do affect the rainfall, as I believe they do, then it is up to the government to see that those forests are maintained. The lumber may be cut down and sold, but it is up to the government to see that those forests are maintained and that new trees are allowed to grow and be cultivated and protected from cattle. Now, the reason of this is mainly for the small landholder, I think. Kona, North Kona, has the beginnings of a sugar plantation, but there are great areas of land there that are populated by Hawaiians mainly, the best community of the native Hawaiian that is to be found on these islands, having large families, people who are healthy as a rule. I say that the question of the protection of rainfall is something to be considered in view of the interests of those people, the small landholders; that if possible the droughts which sometimes occur and drive them away from their homes, which make water an article to be supplied by the quart for drinking purposes and sometimes not obtainable even then, should be lessened—that the conservation of forests there in that region reaching from North to South Kona, Kau and in the Puna district, is something to be considered from the standpoint of the small landowner. The same condition exists in Kula on Maui. It was a terrible hardship to those people last year to have to leave their homes because they had no water and had to drive their livestock miles away every other day to get water to keep them alive. In Kau the ground was strewn with cattle which had starved to death for want of grass and water. For the protection of the graziers this policy of conservation must be considered. And with it goes the preparation of reservoirs for retaining large quantities of water. I am afraid that the progress of the conservation of water in dry regions like Kona and Kau will be slow. There are no streams there. The soil is very porous. It takes a very heavy rainfall to send a stream down the slope into the sea, and the conservation of water in those places will mean much outlay of money in order to make a reservoir. To make it water tight the whole area of the reservoir will have to be cemented. The expense is great, and in view of the expense and the time which will be taken up before such kinds of conservation can benefit that community—the small landholders—I think it is most important for the government to consider the relation of forests in that part of the country to the rainfall. I need not refer to the prosperous Island of Kauai, an island of wonderful streams, but of neglected forests, however, in parts of it, forests diminishing steadily, but which can be easily protected and restored with a little expenditure of money and intelligent care.

The Chairman. On the opening day of the session there was introduced in the Lower House a resolution by the Honorable Mr. Affonso of Hilo, which provided that the Governor appoint, as soon as may be after the adoption of the resolution, a commission of three to look into the question of farm products and the marketing of the same, both between the islands and on the mainland. That resolution was adopted by the House and adopted by the Senate, and was signed by the Governor a day or two ago. There was later introduced a bill by the Honorable Mr. Furtado which called for an appropriation—a subsidy—of $50,000 a year to a steamship line which would give better trading facilities between here and the mainland for farm products, etc., that grow on these islands. The Committee on Forestry, Agriculture, Promotion and Immigration of this House saw fit to table or recommend that the bill be tabled, and that the clerk be instructed to send a copy of this bill to the commission to be appointed by the Governor. The House of Representatives saw fit to adopt the committee's report, and it looks as though this commission, which the Governor in due time will appoint, will have something to do. Prior to the appointment of the commission, however, I am going to call on Dr. Wilcox to address us, and he will speak on the products and marketing of farm crops.

Dr. E. V. Wilcox. Mr. Chairman, Ladies and Gentlemen: In the few minutes that I have I want to call attention to a very few specific matters regarding the possiblity of the marketing of a whole lot of things which we now produce more or less for which we seem to have no market. Whether or not that is the logical way to discuss the matter, however, I wish to speak of marketing first because I think you will all realize and agree with me that there is very little use in producing large quantities of crops which now do not appear on the market.

It has been frequently brought to my attention that there is no money to be made in the marketing of certain things, but I wish to call to your attention that continually inquiries are being made at the Experiment Station from men on the mainland, and even from people here in Honolulu, regarding the possibility of securing more of certain things raised here. I have had considerable correspondence recently with a man on the mainland, for example, who wished to get ten tons of dry roselle, for which he is willing to pay eighteen cents a pound here in Honolulu. Much difficulty has been met with in learning whether the cultivation of roselle could be increased sufficiently to supply the quantity required by this one man. The party in question would be glad also to get the article in three or four times the quantity mentioned. Inquiries have also been received for the names of parties who deal in taro products in order to introduce these products to mainland markets. The two matters mentioned are sufficient to show that there is a demand on the mainland for some of our products. The two matters mentioned above happen to be the only ones which have come to my attention.

The success attained by the sugar planters of the islands is due as much to their organized and systematic efforts in securing and exploiting the market for sugar as to their actual production of it. In order to secure markets for any product it is necessary to organize in a systematic way and make known to the public what you have to sell. Now, there is one way by private effort of securing markets for produce, and that is by means of coöperative organizations of producers, such as have been formed in nearly all parts of the mainland and in various foreign countries. The chief difficulty with such an organization is getting it established in a community which is unfamiliar with that method. One of the first difficulties lies in the mutual jealousies between men who are producing any given crop. This leads to a lack of confidence in the men who are chosen as officials of the organization and in the efficiency of any constitution which might be adopted for regulating the business of the organization. It should be a very simple problem to adopt rules which will put everyone on the same footing. In the absence of definite plans for a coöperative organization among producers of various small crops, it seems desirable that the Territory should render assistance in establishing an effective system of marketing. It is hoped that Territorial assistance will be necessary only so long as it must be required to set the scheme in operation. In the meantime the proper men will doubtless appear to take over the management of the business and organize it as a coöperative association of producers. They ought then to get along without further Territorial assistance. In these days of large corporations, agriculture is not exempt to the general rule; the small producer with a small quantity of produce brought to market at irregular intervals cannot satisfy the demands of the dealer, nor secure any business concessions from transportation agents. The only way to avoid the inconveniences met with by the small producer is to organize so that the products of the organization as a whole total in time a large amount. Transportation companies can then look upon the freight proposition in the same way they consider the freight business of large corporations.

In encouraging diversified agriculture the first step necessary would seem to be that of learning the names of dealers who wish to handle agricultural products, and the quantities and kinds of such products which they can handle. It would also be necessary to get a list of the producers who are raising such material and who can reasonably be depended upon to furnish it. It will undoubtedly be necessary in the adoption of such a scheme to have a sort of commission house or landing place where such articles can be received and from which they can be distributed to those who need them. In this way it is hoped that enough producers can be found to send their products to this common center, and thus to have a constant supply of products which will satisfy local demands. Not only will this marketing organization have the effect of bringing in a constant supply, but opportunity will be had to keep the producer informed as to the kinds of farm products which are actually needed and as to the best methods of packing and shipping this material.

There is at present a local demand for sweet potatoes far in excess of the supply. The local demand is not only for a large quantity, but for a more uniform article, so that the consumer will be able to call for a definite variety and will be assured that he will obtain what he desires. The local sweet potato market could be greatly extended by the development of those varieties which are most in demand. Now, if there is one lesson which California, for example, has taught the world, it is the lesson that it pays to give attention to the product before you send it to market. The very fact that California has sent oranges three thousand miles across the country and put them into the market in competition with local products proves the value of careful methods of marketing.

We come now to the question of scientific problems connected with crop production. At present the Hawaii Experiment Station has its work organized around one chief problem, namely, that of preserving soil fertility indefinitely. It is to be accomplished by determining the best system of crop rotation and treatment of soil by fertilizers, so that to make the operation of farm management fit in with the plan of raising one particular crop as the money crop. The present plan involves the demonstration of best methods to accomplish these results with pineapple, cotton, rubber, taro and in the production of forage and rice. The plan of farm management, in order to be scientifically correct and successful from a business standpoint, must be such that the yield of the money crop will be maintained at the highest point rather than diminished as each rotation comes around. Some of the crops which must be used in rotation with the chief money crop can thus be sold, while others will be used as forage for farm animals and for benefiting the physical and chemical condition of the soil. The need of such rotation has been felt most keenly by the pineapple growers, but it is necessary with every crop. It is impossible to secure maximum yields of pineapples when this crop is grown continuously on the same soil. The interruption of continuous pineapple plantings with other crops will not only produce the profits but will permanently maintain the fertility of the soil.

The necessity for the production of more forage on ranches is evident from the great loss of cattle which was suffered during the present season of drought. There is no possible way of increasing the carrying powers of the grazing lands and putting the business of ranching on a solid foundation except to produce enough forage to tide over the animals during the period of drought and thus relieve the overstocked ranches.

The Chairman. The chairman has been informed that he was in error when he stated that Honorable G. F. Affonso introduced the joint resolution referred to. The resolution was introduced by Honorable A. D. Castro. The chairman finds that its list of speakers has been materially diminished. We have one other gentleman, the Honorable W. O. Smith, President of the Senate, however, whom I will now call on for a few remarks.

Senator W. O. Smith. Mr. Chairman, Ladies and Gentlemen:

The hour is late and there is little I wish to say except that I wish to add to what Governor Frear has said in regard to the impressiveness of the meetings of the Conference of Governors in May last. During those three days not only were the Governors, the President and many of the high officials of the great country brought and gathered together there, but in addition there were also many of those great master minds, the captains of industry, who came and gave the most intense attention to the subject of the conservation of the natural resources. It was a matter of pride to me that what little we had to say of Hawaii was so much to the credit of Hawaii. We had very little opportunity to speak in public. But what has been done in Hawaii for the utilization of water is a matter which is a cause for pride, as is also the matter of our forest reserves. Many of the States did not even have forest laws, but over one-tenth of the whole area of these islands is now under forest reserves. There is a little less than four million two hundred thousand acres of land in the whole of the islands of the group. One-tenth is under forest reservation, and with a provision that they should be free from taxes. Much has been done, but we have much more to do. I think that together with the matter of conserving and saving the forests, there is the question of development of the products along the lines of the work that Dr. Jared G. Smith is doing in Kona. The experiments being made in tobacco culture is one of the hopeful things for the future. And at no time since the experiments, way back in the fifties, on Kauai, has there been so much to be hoped for from the cultivation of marketable tobacco which is now being done at Kona by Dr. Smith, and those associated with him. We must have products beside sugar. While we also have the small farming, the truck-farming and all that, we do want to have other products which the world's markets call for. For illustration, take Sumatra, Ceylon, Java, Cuba, the Philippines, and Porto Rico. What do they grow? In the Philippines, sugar, tobacco, hemp. In Java the main industry is sugar, and they are to have other products, and so we find it in Cuba. Now the time may come when we shall need another crop besides sugar. Our salvation is to have other things than sugar, and I hail with great pleasure and with great anticipation the experiments that are being made in such directions, and I think that some of the help that we in the Legislature can give, as far as we are able to with the means that can be spared, is to assist the Federal Experiment Station, and to assist in the matter of a hydrographic survey—that is, the water survey; and the soil survey, and the experiments with products which will have world's markets, products which a man with but a few acres and small capital can engage in. The most indepedent man in this world is the man that owns his own land and makes his living on it. He is a king. He is a sovereign. A man whose living depends upon a salary or wages is some one's servant; but the man who owns his own few acres and is able to produce enough to support himself and his family is a king, he is a sovereign, he can defy anybody as long as he pays his taxes and has no debts. It is a thing that we must work for in this Territory more and more. There is no use in bringing small farmers here unless there is something that they can produce at a profit; unless there is something that a man with a few acres of land and small means can make a living on, and so I hail the work which men like Dr. Smith and Dr. Wilcox are doing.

The Chairman. This concludes the speaking. The Senate and House desire to extend thanks to the Governor and the other gentlemen for their remarks.